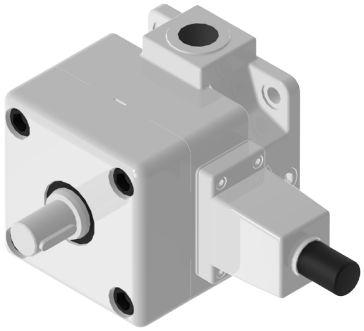
Vane pump V3/40

NS 40 | p_{max} 10 MPa | Q_{max} 40 dm³/min | WK 144 618

DATA SHEET - INSTRUCTION MANUAL

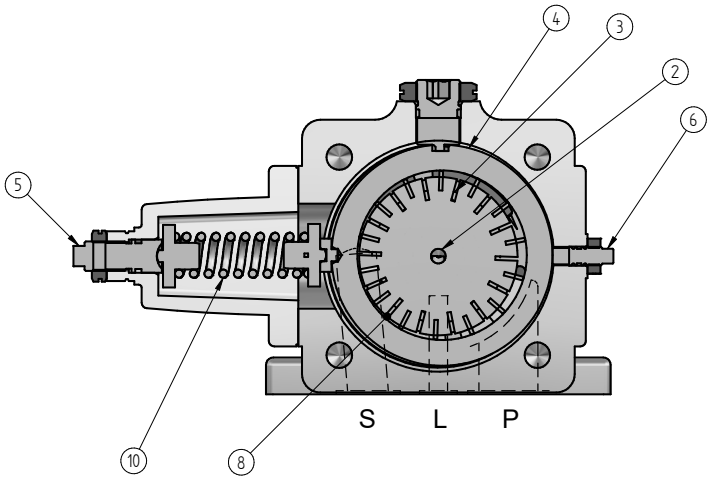


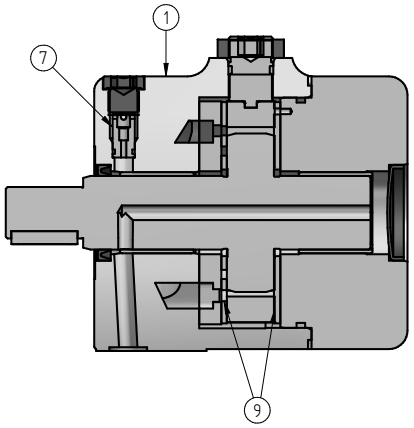
APPLICATION

Vane pump type V3 is used for generation oil flow in hydraulic devices and systems.
Advantages of the pump:

- easy start-up thanks to automatic air bleeding
- low noise level
- long bearing life thanks to hydrodynamically lubricated plain bearings
- good sliding properties of cover and control discs thanks to bronze-coating and semi-fluid friction.

DESCRIPTION OF OPERATION





Hydraulic pumps type V3 are vane pumps of variable displacement and settable pressure. The pump V3/40 consists of the body 1, rotor 2 with vanes 3, stator 4, pressure setting 5, volume screw 6, valve for automatic air bleed 7 and control discs 9.

Suction and pumping
The chambers 8 used for moving the working fluid are created by two vanes 3, rotor 2, stator 3 and the discs 9. By rotation of the rotor in the right direction, the chambers 8 are separated from the suction side. When the rotation continues, they become connected with the pressure size, their volume decreases and the fluid is delivered through the pressure port P to the hydraulic system. The setting screw 6 is used for limiting the maximum volume of the fluid flow.

Setting up the pressire
The circular ring of the stator 4 is held by the spring 10 in eccentric position. The required maximum pressure in the system is set up by using the spring 10. After reaching the set-up pressure, the stator 4 shifts (overcoming the tension of the spring 10) changing the eccentricity of the position, until obtaining minimal flow compensating the leakages. After a pressure drop in the system, the stator 4 goes back to its eccentric position and the pump obtains the full value of the set-up capacity.

Installation
Vane pumps type V3 can be installed in any positions. The pump may be connected to hydraulic systems only by means of flexible hydraulic hoses.

Drive
The axes of the pump and motor shafts must be in line (they must be coaxial). Make sure that the pump shaft ends do not transmit any axial or radial forces. The pump can be connected to the electric motor only by means of a flexible coupling with compliance with the coaxiality conditions as specified by the manufacturer of the coupling.

Oil tank
Capacity of the tank must be selected in such a way as to prevent excessive temperature rise of the oil. If it is not possible, oil coolers should be used.

DESCRIPTION OF OPERATION cont.

Suction line

The suction line should be designed in such a way as not to exceed the values of inlet pressure, specified in the table below. The leakage lines should be fitted minimum 100 mm above the suction line and should be formed in such a way thatthe leakages do not get immediately sucked back into the pump. The suction lines and the leakage lines should be at least 200 mm apart. The pipe ends should be cut at a 45° angle and should not reach within 50 mm of the tank bottom. All pipelines even at the minimum oil level in the tank must be dipped minimum 50 mm in order to avoid the build-up of foam.

TECHNICAL PARAMETERS

hydraulic fluid	mineral oil	
required cleanliness class of oil	ISO 4406 class 20/18/15	
nominal fluid viscosity	37 mm^2/s at temp. 55°C	
viscosity range	p_{rob} < 6,3 MPa	16 ÷ 160 mm^2/s
	p_{rob} > 6,3 MPa	25 ÷ 160 mm^2/s
fluid temp. range (in the tank)	40 ÷ 55°C	
ambient temperature range	- 10 ÷ 70°C	
max. flow capacity	47 dm^3 at n = 1450 min^{-1} p = 1 MPa	
pressure – at the inlet	- 0,02 (underpressure) ÷ 0,5 MPa (overpressure)	
pressure – at the outlet	max. 10 MPa	
leakage pressure	max. 0,2 MPa	
torque	max. 235 Nm	

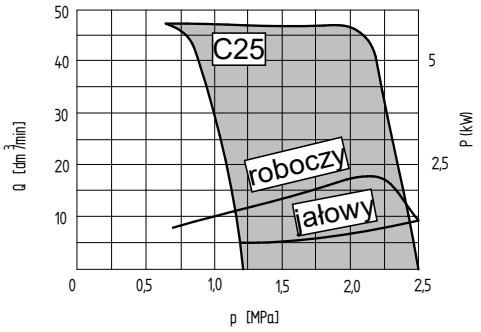
number of rotations per minute	1000 ÷ 1800 min^{-1}	
pressures range depending on the spring type	C25	1,2 ÷ 2,5 MPa
	C40	2,0 ÷ 4,0 MPa
	C63	3,0 ÷ 6,3 MPa
	C100	5,0 ÷ 10 MPa
mounting method	flange mounting	
direction of rotation	right (or left only for 1PV6)	
connection method	threaded connections	
shaft loading	the shaft cannot transfer any axial or radial loads	
weight	26,5 kg	

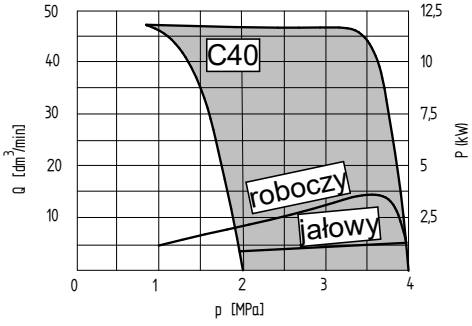
assembly and operation requirements at: **www.operating-conditions.ponar.pl**

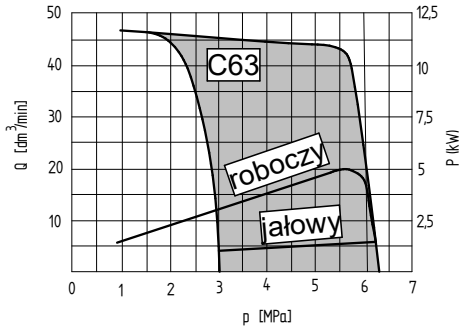
PERFORMANCE CURVES

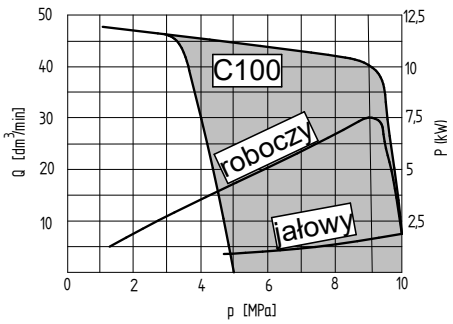
measured at viscosity ν = 41 mm^2/s and temperature t = 50°C

performance curves of flow rate in relation to working pressure and power consumption for working and constant (leakage) flow rate, measured at 1 1450 min^{-1}



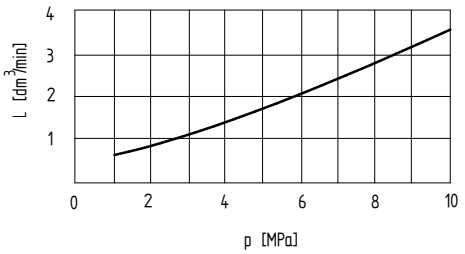




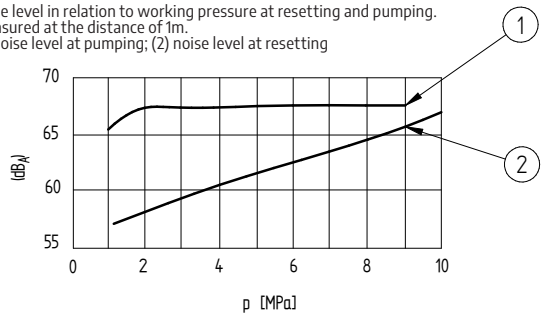


PERFORMANCE CURVES cd.

leakages in relation to working pressure

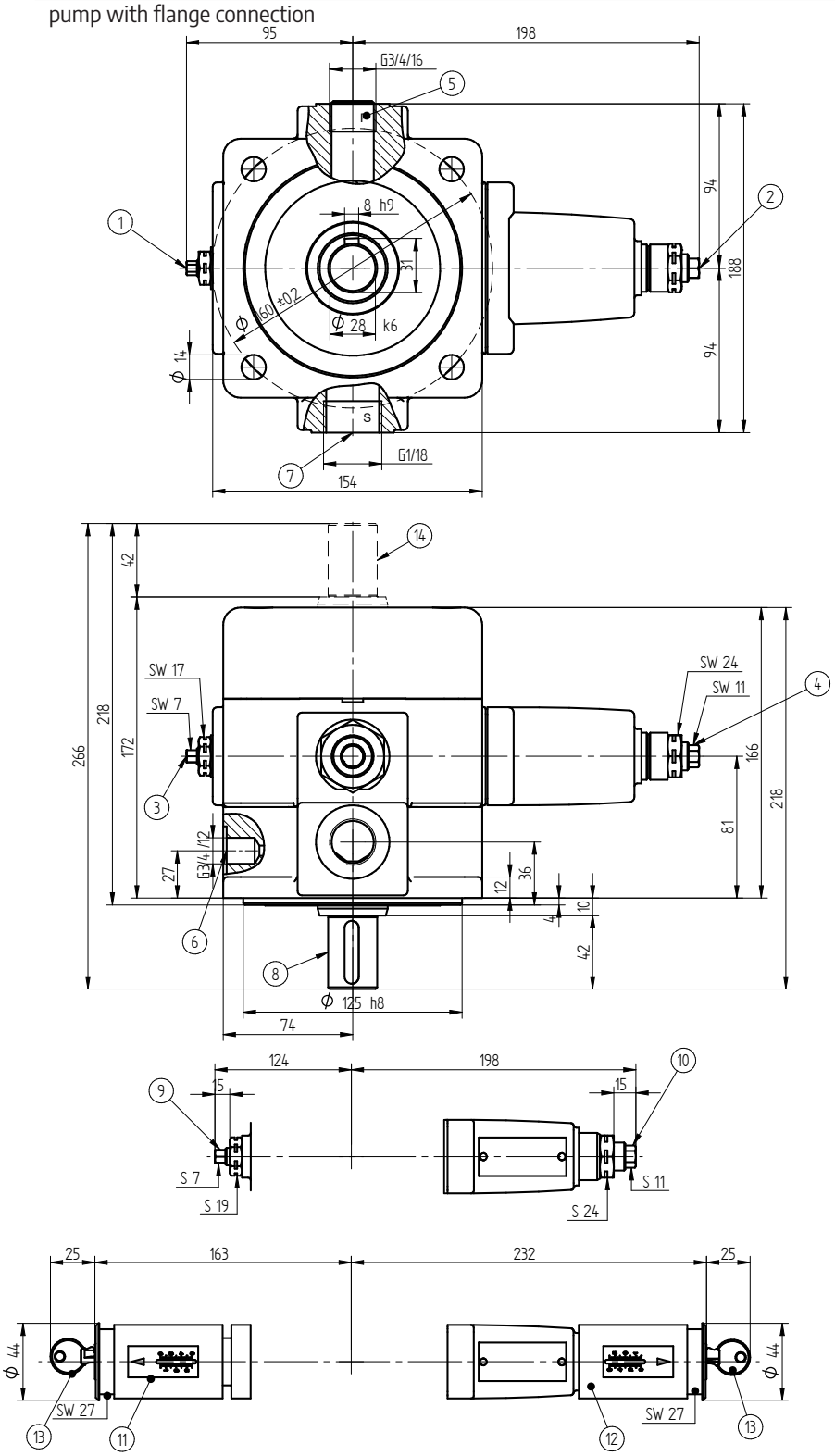


noise level in relation to working pressure at resetting and pumping.
Measured at the distance of 1m.
(1) noise level at pumping; (2) noise level at resetting



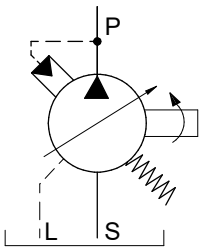
OVERALL AND CONNECTION DIMENSIONS

pump with flange connection



1. flow rate setting:
   - rotation to the right decreases flow rate
   - rotation to the left increases flow rate
2. pressure setting:
   - rotation the the right increases working pressure
   - rotation to the left decreases working pressure
3. flow rate setting (by means of a setting screw A)
4. pressure setting (by means of a setting screw C)
5. pressure connection
6. leakage coonnection
7. suction connection
8. drive shaft for version with rigth directions
9. flow rate setting with an external square end H
10. pressure setting with an external square end H
11. flow rate setting with a key lock S
12. pressure setting with a key lock S
13. key length 43 mm
14. second end of the shaft

HYDRAULIC DIAGRAM



HOW TO ORDER

1PV2V3 ☐ / 40 ☐ ☐ ☐ ☐ ☐ ☐ 1 *

1 2 3 4 5 6 7 8 9 10

1 series number

series 20 =	**20**
(20 ÷ 29) - connection and installation dimensions unchanged	

2 nominal output size (NS)

NS40 =	40

3 direction of rotation

right =	**R**
left =	L
version with 2 shadt ends =	D

4 connection method

threaded connections =	1
subplate =	8

5 seal type

NBR (for fluids on mineral oil base) =	**M**
FKM (for fluids on phosphate ester base) =	V

6 pressure setting method

with a hexagon head screw =	**C**
with a square head screw =	H
pressure adjustment with a key lock =	S

7 zero stroke pressure range

2,5 MPa =	25
4,0 MPa =	40
6,3 MPa =	63
10,0 MPa =	**100**

8 flow setting

with a hexagon head screw =	**A**
with a square head screw =	H
flow regulator with a key lock =	S

9 air bleed valve

air bleed valve =	1

10 further requirements = *

(to be agreed upon with the manufacturer)

Ø indicates that the box should be left blank.
The symbols in **bold** are the preferred versions available in short delivery time.

Coding example: **1PV2V3-20/40R1MC100A1**

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